



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Serial No. : 10/021,929
Applicant : Katrina G. Desroches et al.
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Examiner : Norca Liz Torres Velazquez

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Title : Method for Controlling Thermohysteresis During
Thermoforming of Three-dimensional Fibrous
Compound Constructs and Products Thereof

Docket No. : PGI6044P0271US
Customer No. : 32116

Commissioner For Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

DECLARATION UNDER 37 C.F.R. §1.132

Sir:

Your Declarant, Gale Shipley, hereby states as follows:

i am the Technical Manager for the automotive division of the Industrial Business Unit at
Polymer Group, Inc.;

I have a Bachelor of Science Degree in Biology and Chemistry, and over 8 years of
experience in industry in these fields, including over 3 years of experience with the Assignee of
the present application, and consider myself to be a person skilled in the art of textile and
nonwoven fabric constructs;

I have studied the outstanding Official Action, mailed November 14, 2005, in response
to the presently pending claims of our above-identified application, and have studied and am
familiar with the cited prior art patent references, including U.S. Patent No. 5,492,580 to
FRANK, and U.S. Patent No. 4,840,832, to WEINLE et al.;

In my opinion, the product of the FRANK reference or the product of the WEINLE et al.
in view of FRANK is different from the claimed product. The FRANK product is known in the art

and can be described as a fiber-reinforced plastic (FRP). FRP is a composite consisting of a high percentage of low melt binder fiber and reinforcement fiber. The composite described in FRANK is approximately 40-80% low melt binder fiber. As described in FRANK, column 6, lines 33-39, "The composite ends up being a nonwoven structure of the first reinforcement fibers which are thoroughly mixed throughout and encapsulated entirely by the resin formed from the second melted fibers, the composite having an air volume of 20 percent or less and preferably in the range of 10-15 percent." The FRANK product is a highly rigid construct as a result of the high percentage of low melt binder permitted to flow;

The presently claimed product utilizes less than about 40 percent low melt binder polymer, which is provided by one of the polymer components of heat-activated binders having plural polymer components (sometimes referred to as bi-component or multi-component fiber). Further, the claimed product is heated to activate the multi-component binder fibers to form a plurality of fiber-to-fiber point bonds throughout, resulting in a less rigid board product. This is an important characteristic of the present invention, as specified in the pending claims, in order to achieve the necessary performance characteristics for the intended thermoforming application of the present fibrous board product;

As specified in FRANK, column 5, lines 24-30, "Immediately upon completion of the heating process by unit 18, the heated nonwoven structure with its melted thermoplastic resin is directed through a compression stage wherein, as described above, the resin flows throughout the nonwoven structure encapsulating the first reinforcement fibers and displacing the air voids therein." The lack of air voids in the FRANK product detracts from the acoustical performance of the product;

By way of the present invention, the heating and compression steps of the fibrous product, including binder fibers having plural polymer components, provides fiber-to-fiber point bonds. The distinctive bonding relationship between the fibers inherently allows for a higher

percentage of air voids in the product. As known by those skilled in the art, the presence of air voids in the product will enhance the acoustical properties of the product. The acoustical performance is a desirable characteristic for the intended thermoforming application of the presently claimed product;

The FRANK product would appear to be utilized for a dissimilar molded product application. In column 1, lines 27-36, of the FRANK patent, a trunk-liner product is described, wherein a more rigid, plastic-like product is desirable to protect electronic components. The claimed invention is more suited for use as acoustical panels, automotive interior panels, appliance facing, and other applications where acoustic properties are desired;

Additionally, the FRANK product has a preferred basis weight of about 300 grams per square meter (gsm) or higher (col. 4, lines 29-30), whereas the presently claimed product has a preferred basis weight of about 700 gsm or higher, which is supported by the data presented in Tables 1-4;

I understand from the Examiner's Official Action that she considers the process used by FRANK to produce the same final product as the presently claimed product. In my opinion, the product produced by FRANK is not the same final product as the presently claimed product and would not be utilized in the same thermomolded end use applications. A sample product produced by the FRANK process and a sample product produced by the present invention is enclosed herewith to demonstrate the obvious difference in the final products. It should be noted that the enclosed product made by the FRANK process still has 33% air void volume, wherein the claimed FRANK product actually has an air void volume of 20% or less. The rigidity of the FRANK product is evident compared to the presently claimed product;

It should be further noted, the automotive industry prefers the use of the product of the present invention for thermomolded interior panels, such as headliner. The product of the present invention is machine cut to size to fit the commercial molds used by the automotive

suppliers. This preference by the automotive suppliers of a semi-rigid board, as disclosed in the present invention, is creating a heightened turn in activities by our competitors to produce competitive semi-rigid boards. We have inside knowledge that a number of our competitors are purchasing equipment to provide the semi-rigid boards, as we be believed to be claimed in our invention;

In my opinion, Examples of the present invention set forth in the Specification which employ multi-component fibers are commensurate in scope with the presently pending claims, with such Examples demonstrating the improved performance characteristics achieved by practice of the present invention in comparison to the Comparative Examples. It is believed that products which have not been formed to have a thermal history in accordance with the present invention, such as those contemplated by the cited WEINLE et al. reference, would not exhibit the enhanced performance characteristics such as demonstrated by the Examples.

I declare that all statements made herein on my own knowledge are true, and that all statements made on information and belief are believed to be true, with the understanding that willful false statements and the like are punishable by fine or imprisonment, or both, under 18 U.S.C. §1001, and may jeopardize the validity of the application or any patent issuing under the above-identified application.

The Commissioner is hereby authorized to charge any additional fees which may be required in connection with this submission to Deposit Account No. 23-0785.

Respectfully submitted,

By Gale Shipley
Gale Shipley

Date: 2/27/06